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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/684,387	GELVIN ET AL.	
	Examiner	Art Unit	
	IMAD HUSSAIN	2451	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,9-14,16,18,20-24,27-38,40,41,43,45-53 and 56-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9-14,16,18,20-24,27-38,40,41,43,45-53 and 56-60* is/are rejected.

7)☒ Claim(s) *61* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03 December 2008 has been entered.

2. Claims 1, 3, 11, 12, 16, 18, 20-24, 27-38, 40, 41, 43 and 49-55 have been amended.

3. New claims 56-61 have been added.

4. Claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, 45-53 and 56-61 are currently pending in Application 09/684387.

Election/Restrictions

5. Claims 54, 55 and 62 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 24 February 2009.

Response to Arguments

6. Applicant's arguments, see pages 19-20 of Applicant's Arguments/Remarks, filed 03 December 2008, with respect to 103(a) rejection of independent claims 1 and 50 and

their respective dependent claims have been fully considered and are persuasive. However, a new grounds of rejection is made in view of Sadao Ito (US 5095531 A, hereinafter *Ito*) and Jack R. Williams (US 5617371 A, hereinafter *Williams*).

Applicant argues, regarding claim 1, that the combination of Agre and Kulka fails to address the newly added limitation of *a sensor node comprising a multiple-mode radio frequency modem operable to transmit on multiple channels, wherein transmission on the multiple channels allows the sensor node to simultaneously join multiple clusters of a network, and wherein each of the clusters comprises a respective base node that can communicate with one or more sensor nodes within a range of the base node.*

Examiner agrees with Applicant's assertion. However, Ito teaches the claimed limitation [Ito: Abstract].

Applicant argues, regarding claim 50, that the combination of Agre, Kulka and Walter fails to address the newly added limitation of *a flexible substrate that operates as an acoustic sensor and an acoustic source, wherein the acoustic sensor is used in determining a position of the sensor node, and wherein the sensor node communicates information identifying the determined position of the sensor node to the other node.*

Examiner agrees with Applicant's assertion. However, Williams teaches the claimed limitation [Williams: Abstract].

7. Applicant's arguments, see pages 23-24 of Applicant's Arguments/Remarks, filed 03 December 2008, with respect to the double patenting rejection have been fully considered and are persuasive. The obviousness-type double patenting of claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43 and 45-53 has been withdrawn.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 9-10, 12-14, 18, 22, 23, 27-29, 32, 35, 40, 41, 47, 48 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agre et al. (US 6208247 B1, hereinafter *Agre*) in view of Harvey J. Kulka et al (US 5483827, hereinafter *Kulka*) in further view of Sadao Ito (US 5095531 A, hereinafter *Ito*).

Regarding claim 1, Agre teaches *a sensor node comprising:*

at least one processor [Agre: Column 5 Lines 32-33]*;*

at least one energy source [Agre: Column 4 Lines 66-67]*; and*

at least one substrate [Agre: Column 5 Lines 18-20 "sensor"] *coupled among the at least one processor* [Agre: Column 5 Lines 32-33] *and the at least one energy source* [Agre: Column 4 Lines 66-67],

wherein the at least one substrate comprises at least one sensor [Agre: Column 5 Lines 18-20].

Agre does not explicitly disclose:

that *the at least one substrate is flexible; or*

that *the at least one substrate physically supports the at least one processor and the at least one energy source.*

However, Kulka teaches:

that *the at least one substrate is flexible* [Kulka: Column 4 Lines 50-51]*; and*

that *the at least one substrate physically supports the at least one processor and the at least one energy source* [Kulka: Abstract, Column 2 Lines 62-63 and Column 3 Line 11].

Agre and Kulka are analogous art in the same field of endeavor as both describe sensor systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the flexible substrate scheme of Kulka in the system of Agre. One of ordinary skill in the art would have been motivated to modify the system of Agre with the flexible substrate scheme of Kulka because in doing so, the system would allow for more easily conforming the sensor device to the surface upon which it is to be attached [Kulka: Column 4 Lines 50-52].

The combination of Agre and Kulka (hereinafter *Agre-Kulka*) does not explicitly disclose:

a multiple-mode radio frequency modem operable to transmit on multiple channels;

wherein transmission on the multiple channels allows the sensor node to simultaneously join multiple clusters of a network, and

wherein each of the clusters comprises a respective base node that can communicate with one or more sensor nodes within a range of the base node.

However, Ito teaches:

a multiple-mode radio frequency modem operable to transmit on multiple channels [Ito: Column 8 Lines 62-65]*;*

wherein transmission on the multiple channels allows the sensor node to simultaneously join multiple clusters of a network [Ito: Column 8 Lines 65-66]*, and*

wherein each of the clusters comprises a respective base node that can communicate with one or more sensor nodes within a range of the base node [Ito: Column 8 Line 66].

Agre-Kulka and Ito are analogous art as both describe communication equipment. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the multiple-mode scheme of Ito for connecting to multiple base stations on multiple channels simultaneously in the system of Agre-Kulka. One of ordinary skill in the art would have been motivated to modify the system of Agre-Kulka with the multi-mode scheme of Ito because in doing so, the system would remove adverse effects on data signals and allow for greater reliability in data transfer [Ito: Column 8 Lines 17-23].

Regarding claim 9, the combination of Agre-Kulka and Ito (hereinafter *Agre-Kulka-Ito*) teaches *at least one communication physical layer including radio frequency (RF) power management* [Agre: Column 3 Lines 53-56].

Regarding claim 10, Agre-Kulka-Ito teaches that *the at least one processor is coupled to at least one component selected from a group consisting of actuators, sensors, signal processors, interfaces, power supplies, data storage devices, and communication devices* [Agre: Figure 3].

Regarding claim 12, Agre-Kulka teaches that *the at least one energy source includes a thin film photovoltaic device, wherein the thin film photovoltaic device is an energy source and an optical presence detection sensor* [Agre: Column 5 Lines 61-63 and Column 6 Line 65].

Regarding claim 13, Agre-Kulka-Ito teaches that *the sensor node is coupled to at least one item selected from a group consisting of machinery components, electronic equipment, mechanical equipment, electro-mechanical equipment, a facility, a structure, a material, a biological system, people, animals, vegetation, clothing, crates, packages, product containers, shipping containers, a transportation system, vehicle components, an outdoor area, and an indoor area* [Agre: Column 4 Lines 51-58 and Column 1 Lines 8-13].

Regarding claim 14, Agre-Kulka-Ito teaches that *the at least one sensor receives at least one signal type selected from a group consisting of temperature, shock, vibration, motion, acceleration, tip, light, sound, and package opening and closing* [Agre: Column 3 Lines 14-16].

Regarding claim 18, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node and at least one client computer* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52] and that *the sensor node* is *coupled to the at least one client computer* [Agre: Column 5 Lines 40-44] *through the plurality of network elements, wherein the at least one node supports at least one communication mode selected from a group consisting of wireless communications, wired communications, and hybrid wired and wireless communications* [Agre: Column 1 Lines 37-40 and Column 2 Lines 30-31], *wherein at least one redundant communication pathway* [Agre: Figure 2] *is established among the plurality of network elements.*

Regarding claim 22, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a plurality of network element sets that are layered.* [Agre: Column 12 Lines 35-43 and Column 11 Lines 34-36].

Regarding claim 23, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52] and that *the at least one node comprises a plurality of node*

types, wherein the plurality of node types includes at least one node of a first type and at least one node of a second type [Agre: Column 3 Liens 50-53 "user" and non-user nodes], *wherein a first network having a first node density is assembled using the at least one node of a first type, wherein a second network having a second node density is assembled using the at least one node of a second type, wherein the second network is overlayed onto the first network* [Agre: Column 11 Lines 34-39].

Regarding claim 27, Agre-Kulka-Ito teaches that *data processing is controlled using at least one processing hierarchy* [Agre: Column 9 Lines 62-65], *the at least one processing hierarchy controlling at least one event selected from a group consisting of data classifications, data transfers, data queuing, data combining, processing locations, communications among the plurality of network elements* [Agre: Column 10 Line 64].

Regarding claim 28, Agre-Kulka-Ito teaches that *data is transferred using message packets, wherein the message packets are aggregated into compact forms in the plurality of network elements using message aggregation protocols* [Agre: Column 3 Lines 7-9], *wherein the message aggregation protocols are adaptive to data type, node density, message priority, and available energy* [Agre: Column 6 Lines 5-8].

Regarding claim 29, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52] and that *the functions of the at least one node include data*

acquisition, data processing, communication, data routing, data security, programming, and node operation [Agre: Column 3 Line 8].

Regarding claim 32, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52] and that *the at least one node controls data processing and data transmission in response to a probability of a detected event* [Agre: Column 11 Lines 50-58].

Regarding claim 35, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52] and that *data is collected from the sensor node by the at least one node, wherein at least one operation is performed on the data in response to parameters established by a user, the at least one operation selected from a group consisting of energy detection, routing, processing, storing, and fusing, wherein the routing, processing, storing, and fusing are performed in response to at least one result of the energy detection* [Agre: Column 5 Lines 29-44].

Regarding claim 40, Agre-Kulka-Ito teaches that *at least one of the plurality of network elements determines a position of the sensor node* [Agre: Column 12 Lines 33-50].

Regarding claim 41, Agre-Kulka-Ito teaches that *the sensor node determines at least one position using location information received from at least one of the plurality of network elements* [Agre: Column 12 Lines 33-50].

Regarding claim 47, Agre-Kulka-Ito teaches that *the at least one energy source is a photovoltaic device incorporated in or mounted on the at least one substrate* [Agre: Column 5 Line 62 and Kulka: Column 2 Lines 62-63 and Column 3 Line 11].

Regarding claim 48, Agre-Kulka-Ito teaches that *the at least one substrate operates as a vibration and acoustic sensor* [Agre: Column 6 Lines 49-67].

Regarding claim 56, Agre-Kulka-Ito teaches that *the functions of the sensor node are remotely controllable and the sensor node is programmable via wireless internetworking among a plurality of network elements* [Agre: Column 4 Lines 9-11].

10. Claims 2-4, 11 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito in view of Fischer et al. (US 5420825, hereinafter *Fischer*).

Regarding claim 2, Agre-Kulka-Ito does not explicitly disclose that *the at least one substrate comprises active and passive substrates*.

However, Fischer discloses a sensor system that comprises both active and passive substrates [Fischer: Column 1 Lines 49-52].

Agre-Kulka-Ito and Fischer are analogous art in the same field of endeavor as both describe sensor systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the sensor details of Fischer for using particular sensor types in the sensor system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the system of Age with the sensor types of Fischer because in doing so, the system would allow for better trade-offs in power usage and sensitivity [Fischer: Column 3 Lines 13-16].

Regarding claim 3, Agre-Kulka-Ito-Fischer teaches that *the at least one substrate comprises at least one thin film substrate* [Agre: Column 6 Lines 35-37], *wherein the at least one thin film substrate comprises a piezoelectric polymer film* [Fischer: Column 1 Lines 49-52], *wherein the piezoelectric polymer film is polyvinylidenedifloride (PVF_2)* [Fischer: Column 3 Lines 13-16].

Regarding claim 4, Agre-Kulka-Ito-Fischer teaches that *the at least one substrate is conformal* [Fischer: Column 1 Lines 30-32].

Regarding claim 11, Agre-Kulka-Ito-Fischer teaches that *the at least one sensor comprises at least one sensor selected from a group consisting of passive and active sensors* [Fischer: Column 1 Lines 49-52], *wherein the passive and active sensors*

include seismic sensors, acoustic sensors, optical sensors, infrared sensors, magnetic sensors, thermal sensors, accelerometers, and bi-static sensors [Agre: Column 3 Lines 14-20].

Regarding claim 45, Agre-Kulka-Ito teaches that *the at least one substrate operates as an acoustic sensor* [Agre: Column 6 Lines 49-67].

Agre-Kulka-Ito does not explicitly disclose that the substrate operates as a *source*.

However, Fischer teaches that the substrate operates as a *source* [Fischer: Column 1 Lines 49-52].

Agre-Kulka-Ito and Fischer are analogous art in the same field of endeavor as both describe sensor systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the sensor details of Fischer for using particular sensor types in the sensor system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the system of Age with the sensor types of Fischer because in doing so, the system would allow for better trade-offs in power usage and sensitivity [Fischer: Column 3 Lines 13-16].

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito in view of Sohrabi et al. (*A Self Organizing Wireless Sensor Network*, applicant's prior art, hereinafter *Sohrabi*) in further view of Poor et al. (US 6028857, hereinafter *Poor*).

Regarding claim 16, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52] and that *the at least one node is coupled among a monitored environment and at least one client computer* [Agre: Column 11 Line 6 "user interface node"], *wherein functions of the at least one node are remotely controllable using the at least one client computer* [Agre: Column 5 Lines 40-44], *wherein the at least one node provides node information to the plurality of network elements* [Agre: Column 2 Lines 35-43], *wherein data processing is distributed through the sensor network in response to the node information* [Agre: Column 2 Lines 35-43].

Agre-Kulka-Ito does not explicitly disclose that *the information* includes *message priority*.

However, Sohrabi teaches nodal communication using a message prioritization system [Sohrabi: Section 3 Paragraph 2].

Agre-Kulka-Ito and Sohrabi are analogous art in the same field of endeavor as both describe nodal communications systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the priority scheme of Sohrabi for prioritizing messages in the system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the system of Agre-Kulka-Ito with the priority scheme of Sohrabi because in doing so, the system would allow for a higher quality of service [Sohrabi: Section 3 Paragraph 2].

The combination of Agre-Kulka-Ito-Sohrabi does not explicitly disclose that *the information* includes *node resource cost*.

However, Poor teaches nodal communications using a node resource cost [Poor: Column 2 Lines 31-37 and Figures 2-3].

Agre-Kulka-Ito-Sohrabi and Poor are analogous art in the same field of endeavor as both describe nodal communications systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the resource cost scheme of Poor for defining costs of resources in the system of Agre-Kulka-Ito-Sohrabi. One of ordinary skill in the art would have been motivated to modify the system of Agre-Kulka-Ito-Sohrabi with the resource cost scheme of Poor because in doing so, the system would allow for more resource/energy-efficient routing [Poor: Column 2 Lines 31-37].

12. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito in view of Myer et al. (US 6615088 B1, hereinafter *Myer*).

Regarding claim 20, the combination of Agre-Kulka-Ito-Myer teaches that *the plurality of network elements comprise a sensor network including at least network* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52] and that *at least one network includes wired networks, wireless networks, and hybrid wired and wireless networks* [Myer: Column 2 Lines 58-60], *wherein the at least one network comprises at least one network selected*

from a group comprising the Internet, local area networks, wide area networks, metropolitan area networks, and information service stations [Myer: Figure 1].

Regarding claim 21, Agre-Kulka-Ito-Myer teaches that *the internetworking comprises providing remote accessibility using World Wide Web-based tools to data, code, management, and security functions, wherein data includes signals and images, wherein code includes signal processing, decision support, and database elements, and wherein management includes operation of the plurality of network elements* [Myer: Column 4 Lines 28-50].

13. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito as applied above in view of Davis et al. (US 5742829, hereinafter *Davis*).

Regarding claim 24, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52].

Agre-Kulka-Ito does not explicitly disclose that *code and data anticipated for future use are predistributed through the sensor network using low priority messages, wherein the code and the data are downloadable from at least one location selected from a group consisting of storage devices of the plurality of network elements, and storage devices outside the sensor network.*

However, Davis discloses a network wherein code and data anticipated for future use is distributed through low-priority background messages and code and data are downloadable from a storage device [Davis: Column 6 Lines 27-65].

Agre-Kulka-Ito and Davis are analogous art in the same field of endeavor as both describe network communications. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the data distribution scheme of Davis for pre-distributing anticipated information in the system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the system of Agre-Kulka-Ito with the data distribution scheme of Agre-Kulka-Ito because in doing so, the system would minimize the waiting time required to download data [Davis: Column 2 Lines 10-15].

14. Claims 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito as applied above in view of Hayball et al. (US 6233610 B1, hereinafter *Hayball*).

Regarding claim 30, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52] and that *the at least one node includes at least one processor to control the sensor node and at least one device selected from a group consisting of sensors, actuators, communications devices, signal processors,*

information storage devices, node controllers, and power supply devices, supporting remote reprogramming and control of the at least one device [see Claim 1].

Agre-Kulka-Ito does not explicitly disclose *application programming interfaces (APIs), wherein the plurality of APIs are coupled to* the *at least one processor wherein the plurality of APIs are layered.*

However, Hayball discloses such a plurality of layered APIs [Hayball: Column 5 Lines 48-54 and Figure 13] coupled to a node's processor [Hayball: Figure 5].

Agre-Kulka-Ito and Hayball are analogous art in the same field of endeavor as both describe network management systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the layered API scheme of Hayball for using multiple frameworks in the system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the system of Agre-Kulka-Ito with the layered API scheme of Hayball because in doing so, the system would allow for simplified construction of the software of a network system [Hayball: Column 4 Lines 36-39].

15. Claims 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka, Ito and Hayball as applied above in view of Sohrabi.

Regarding claim 31, the combination of Agre-Kulka-Ito-Hayball teaches that *the plurality of APIs enable distributed resource management* [Hayball: Column 1 Lines 38-50] *by providing network resource information* [Hayball: Column 13 Lines 6-12] *to the plurality*

of network elements, wherein information transfer among the plurality of network elements is controlled using a synchronism hierarchy [Hayball: Column 25 Lines 35-37] *established in response to the resource information.*

Agre-Kulka-Ito-Hayball does not explicitly disclose that *the information* includes *message priority.*

However, Sohrabi teaches nodal communication using a message prioritization system [Sohrabi: Section 3 Paragraph 2].

Agre-Kulka-Ito-Hayball and Sohrabi are analogous art in the same field of endeavor as both describe nodal communications systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the priority scheme of Sohrabi for prioritizing messages in the system of Agre-Kulka-Ito-Hayball. One of ordinary skill in the art would have been motivated to modify the system of Agre-Kulka-Ito-Hayball with the priority scheme of Sohrabi because in doing so, the system would allow for a higher quality of service [Sohrabi: Section 3 Paragraph 2].

16. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito as applied above in view of Clare (US 6414955 B1, hereinafter *Clare*).

Regarding claim 33, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node* [Agre: Column 2 Lines 46-48

and Column 3 Lines 50-52] and that *the plurality of network elements are self-assembling* [Agre: Column 10 Lines 11-15].

Agre-Kulka-Ito does not explicitly disclose *search and acquisition modes of the at least one node search for participating ones of the plurality of network elements, wherein a determination is made whether each of the participating ones of the plurality of network elements are permitted to join the sensor network using a message hierarchy, wherein the sensor network is surveyed at random intervals for new nodes and missing nodes.*

However, Clare teaches such a method of node searching and joining [Clare: Column 8 Lines 7-48].

Agre-Kulka-Ito and Clare are analogous art in the same field of endeavor as both describe distributed topography learning methods for wireless networks. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the nodal connection scheme of Clare for joining sensor nodes in the system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the system of Agre-Kulka-Ito with the nodal connection scheme of Clare because in doing so, the system would allow for the nodes to communicate with each other in an ad-hoc manner [Clare: Abstract].

17. Claims 34 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito as applied above in view of LeBlanc et al. (US 6236365 B1, hereinafter *LeBlanc*).

Regarding claim 34, Agre-Kulka-Ito teaches that *the plurality of network elements comprise a sensor network including at least one node* [Agre: Column 2 Lines 46-48 and Column 3 Lines 50-52].

Agre-Kulka-Ito does not explicitly disclose that *the plurality of network elements further include at least one database, wherein the at least one database includes at least one storage device selected from a group consisting of storage devices coupled to at least one of the plurality of network elements and storage devices of the at least one node, wherein the at least one database comprises data-driven alerting methods that recognize conditions on user-defined data relationships including coincidence in signal arrival, node power status, and network communication status.*

However, LeBlanc teaches such a database coupled in a node [LeBlanc: Column 54 Lines 36-41 and Figures 4 and 43 (DA, DB)] with data-driven alerting methods recognizing said conditions [LeBlanc: Column 61 Lines 30-67].

Agre-Kulka-Ito and LeBlanc are analogous art in the same field of endeavor as both describe networked sensor systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the database scheme of LeBlanc for ordered information storage in the system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the system of Agre-Kulka-Ito with the database scheme of LeBlanc because in doing so, the system would allow for more orderly storage of received data.

Regarding claim 36, Agre-Kulka-Ito-LeBlanc teaches that *the routing comprises selecting at least one data type for routing, selecting at least one of the plurality of network elements to which to route the selected data, selecting at least one route to the selected at least one of the plurality of network elements, and routing the selected at least one data type to the selected at least one of the plurality of network elements* [Agre: Column 9 Lines 49-53 and Column 11 Lines 34-36].

Regarding claim 37, Agre-Kulka-Ito-LeBlanc teaches that the *processing comprises selecting at least one data type for processing, selecting at least one processing type, selecting at least one of the plurality of network elements to perform the selected at least one processing type, and transferring the selected at least one data type to the selected at least one of the plurality of network elements using at least one route through the sensor network* [Agre: Column 9 Lines 49-53 and Column 1 Lines 34-36], *wherein the selection of at least one processing type comprises determining at least one probability associated with a detected event and selecting at least one processing type in response to the at least one probability* [LeBlanc: Column 8 Lines 5-10].

Regarding claim 38, Agre-Kulka-Ito-LeBlanc teaches that *the storing comprises selecting at least one data type for storage, selecting at least one storage type, selecting at least one of the plurality of network elements to perform the selected at least one storage type, and transferring the selected at least one data type to the*

selected at least one of the plurality of network elements using at least one route through the sensor network [Agre: Column 11 Line 61-Column 12 Line 12].

18. Claims 43 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito as applied above in view of Mann et al. (US 6809653 B1, hereinafter *Mann*).

Regarding claim 43, Agre-Kulka-Ito teaches that *at least one substrate comprises a thin film tape* [Agre: Column 6 Lines 35-37].

Agre-Kulka-Ito does not explicitly disclose that *the thin film tape includes an adhesive*.

However, Mann discloses a sensory system that includes an adhesive [Mann: Column 2 Lines 53-56].

Agre-Kulka-Ito and Mann are analogous art in the same field of endeavor as both describe sensor nodes. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the adhesive scheme of Mann for securing a sensor in the system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the sensor of Agre-Kulka-Ito with the adhesive scheme of Mann because in doing so, the sensor would remain attached in the proper location [Mann: Column 2 Lines 53-56].

Regarding claim 46, Agre-Kulka-Ito teaches that *the at least one substrate comprises a material suitable for unrolling to different lengths* [Agre: Column 6 Lines 35-37].

Agre-Kulka-Ito does not explicitly disclose that the material is suitable *as a sensor tape*.

However, Mann discloses a sensory system that includes material suitable *as a sensor tape* [Mann: Column 2 Lines 53-56].

Agre-Kulka-Ito and Mann are analogous art in the same field of endeavor as both describe sensor nodes. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the adhesive scheme of Mann for securing a sensor in the system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the sensor of Agre-Kulka-Ito with the adhesive scheme of Mann because in doing so, the sensor would remain attached in the proper location [Mann: Column 2 Lines 53-56].

19. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka and Ito in view of Henderson et al. (US 5203199, hereinafter *Henderson*).

Regarding claim 49, Agre-Kulka-Ito teaches that:

the at least one substrate operates as an accelerometer [Agre: Column 6 Lines 49-67]*; and*

the at least one energy source comprises one or more battery cells [Agre: Column 5 Lines 62]

Agre-Kulka-Ito does not explicitly disclose that the battery cells are *operable to serve as proof masses for the accelerometer*.

However, Henderson teaches that the battery cells are *operable to serve as proof masses for the accelerometer* [Henderson: Column 11 Lines 40-45].

Agre-Kulka-Ito and Henderson are analogous art in the same field of endeavor as both describe sensor nodes. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the proof mass scheme of Henderson for using the weight of batteries in the system of Agre-Kulka-Ito. One of ordinary skill in the art would have been motivated to modify the sensor of Agre-Kulka-Ito with the proof mass scheme of Henderson because in doing so, the battery weights would be taken into account.

20. Claims 50-52 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agre in view of Kulka in further view of Fischer in further view of Jack R. Williams (US 5617371 A, hereinafter *Williams*).

Regarding claim 50, Agre teaches *a sensor node comprising:*

a substrate [Agre: Claim 4] *that operates as an acoustic sensor* [Agre: Column 6 Lines 49-67]*;*

a processor incorporated in or mounted on the substrate [Agre: Claim 4], *wherein the processor is configured to automatically join another node to form a network* [Agre: Column 2 Lines 52-55]; *and*

an antenna incorporated in or carried on the substrate and electrically coupled to the processor for wireless communication with the another node [Agre: Claim 4].

Agre does not explicitly disclose that the substrate is *flexible*.

However, Kulka teaches that the substrate is *flexible* [Kulka: Column 4 Lines 50-51].

Agre and Kulka are analogous art in the same field of endeavor as both describe sensor systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the flexible substrate scheme of Kulka in the system of Agre. One of ordinary skill in the art would have been motivated to modify the system of Agre with the flexible substrate scheme of Kulka because in doing so, the system would allow for more easily conforming the sensor device to the surface upon which it is to be attached [Kulka: Column 4 Lines 50-52].

Agre-Kulka does not explicitly disclose that the flexible substrate *operates as an acoustic source*.

However, Fischer teaches that the substrate operates as a *source* [Fischer: Column 1 Lines 49-52].

Agre-Kulka and Fischer are analogous art in the same field of endeavor as both describe sensor systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the sensor details of Fischer for using

particular sensor types in the sensor system of Agre-Kulka. One of ordinary skill in the art would have been motivated to modify the system of Age-Kulka with the sensor types of Fischer because in doing so, the system would allow for better trade-offs in power usage and sensitivity [Fischer: Column 3 Lines 13-16].

The combination of Agre-Kulka and Fischer (hereinafter *Agre-Kulka-Fischer*) does not explicitly disclose that *wherein the acoustic sensor is used in determining a position of the sensor node, and wherein the sensor node communicates information identifying the determined position of the sensor node to the other node.*

However, Williams teaches that *the acoustic sensor is used in determining a position of the sensor node* [Williams: Column 2 Lines 38-40], *and the sensor node communicates information identifying the determined position of the sensor node to the other node* [Williams: Column 2 Lines 38-40 with Agre: Column 2 Lines 31-32].

Agre-Kulka-Fischer and Williams are analogous art in the same field of endeavor as both describe sensor systems. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the positioning system of Williams for determining the position of a sensor in the sensor system of Agre-Kulka-Fischer. One of ordinary skill in the art would have been motivated to modify the system of Age-Kulka-Fischer with the positioning system of Williams because in doing so, the system would be able to better interpret sensor data [Williams: Column 2 Lines 4-14].

Regarding claim 51, the combination of Agre-Kulka-Fischer and Williams (hereinafter *Agre-Kulka-Fischer-Williams*) teaches that *the flexible substrate* [Kulka: Column 4 Lines

50-51] *is configured to operate as a sensor in an accelerometer* [Agre: Column 6 Lines 49-67].

Regarding claim 52, Agre-Kulka-Fischer-Williams teaches *a photovoltaic device incorporated in or mounted on the substrate* [Kulka: Column 2 Lines 62-63 and Column 3 Line 11], *wherein the photovoltaic device is electrically coupled to provide an energy source for operation of the processor* [Agre: Column 5 Lines 62-63].

Regarding claim 60, Agre-Kulka-Fischer-Williams teaches *the sensor node of claim 50, wherein the flexible substrate comprises a flexible support material and a layer of polyvinylidenedifloride* [Fischer: Column 3 Lines 13-16] *that is applied to the flexible support material, and wherein the layer of polyvinylidenedifloride operates as the acoustic sensor and an acoustic source* [Fischer: Abstract].

21. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka, Fischer and Williams in view of Walter et al. (US 4494121, hereinafter *Walter*).

Regarding claim 53, Agre-Kulka-Fischer-Williams does not explicitly disclose that *the flexible substrate has an aerodynamic shape suitable for deployment by air.*

However, Walter teaches that *the flexible substrate has an aerodynamic shape suitable for deployment by air* [Walter: Column 8 Lines 5-14].

Agre-Kulka-Fischer-Williams and Walter are analogous art in the same field of endeavor as both describe sensor nodes. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the aerodynamic scheme of Walter for shaping a sensor in the system of Agre-Kulka-Fischer-Williams. One of ordinary skill in the art would have been motivated to modify the sensor of Agre-Kulka-Fischer-Williams with the aerodynamic scheme of Walter because in doing so, the system would better meet the physical demands of flight [Walter: Column 8 Lines 5-14].

22. Claims 57-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agre, Kulka, Fischer and Williams as applied to claim 50 above in further view of Thomas D. Petite et al. (US 6437692 B1, hereinafter *Petite*).

Regarding claim 57, Agre-Kulka-Fischer-Williams does not explicitly disclose that *the formed network includes a gateway node that links to another network, and wherein the other network comprises the Internet*.

However, Petite teaches that *the formed network includes a gateway node that links to another network* [Petite: Figure 2 Element 210], *and wherein the other network comprises the Internet* [Petite: Figure 2 Element 230].

Agre-Kulka-Fischer-Williams and Petite are analogous art in the same field of endeavor as both describe sensor nodes. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the networking

scheme of Petite for connecting to the Internet in the system of Agre-Kulka-Fischer-Williams. One of ordinary skill in the art would have been motivated to modify the sensor of Agre-Kulka-Fischer-Williams with the network scheme of Petite because in doing so, the system would be more widely available.

Regarding claim 58, Agre-Kulka-Fischer-Williams teaches that *the sensor node is programmable by a client device* [Agre: Column 4 Lines 9-11 and Column 12 Lines 33-35].

Agre-Kulka-Fischer-Williams does not explicitly disclose that *the formed network includes a gateway node that links to another network, wherein the other network comprises a client device*.

However, Petite teaches that *the formed network includes a gateway node that links to another network* [Petite: Figure 2, Element 210], *wherein the other network comprises a client device* [Petite: Figure 2, Elements 240, 250, "Laptop computer", "Workstation"].

Agre-Kulka-Fischer-Williams and Petite are analogous art in the same field of endeavor as both describe sensor nodes. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the networking scheme of Petite for connecting to client devices in the system of Agre-Kulka-Fischer-Williams. One of ordinary skill in the art would have been motivated to modify the sensor of Agre-Kulka-Fischer-Williams with the network scheme of Petite because in doing so, the system would be more widely available.

Regarding claim 59, Agre-Kulka-Fischer-Williams does not explicitly disclose that *the formed network is operable to detect a sensor node that is attached to a person or to a vehicle*.

However, Petite teaches that *the formed network is operable to detect a sensor node that is attached to a person or to a vehicle* [Petite: Figure 7].

Agre-Kulka-Fischer-Williams and Petite are analogous art in the same field of endeavor as both describe sensor nodes. It would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the vehicle scheme of Petite for placing a sensor in a vehicle in the system of Agre-Kulka-Fischer-Williams. One of ordinary skill in the art would have been motivated to modify the sensor of Agre-Kulka-Fischer-Williams with the vehicle scheme of Petite because in doing so, the system would be able to diagnose vehicle troubles remotely.

Allowable Subject Matter

23. Claim 61 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IMAD HUSSAIN whose telephone number is (571) 270-

3628. The examiner can normally be reached on Monday through Friday from 0800 to 1700.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (571) 272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/I. H./
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Primary Examiner, Art Unit 2457